

The Effect of Teaching Critical thinking on Educational Achievement and Test Anxiety among Junior High School Students in Saveh

Zahra Haseli

Department of Psychology, Saveh Branch, Islamic Azad University, Saveh, Iran
z.haseli65@yahoo.com

and

Fahimeh Rezaii

Department of Psychology, Saveh Branch, Islamic Azad University, Saveh, Iran

Abstract

The current study was done due to the goal of considering the effect of teaching critical thinking on educational achievement and test anxiety among junior high school students in Saveh. What is considerable here is that whether teaching critical thinking is effective in decreasing test anxiety and increasing educational achievement or not. The sample includes the 3rd grade high students in Saveh during the educational year 2012-13, including 4200 students. Since this study is quasi-experimental, the sample including 40 students were randomly divided into 2 groups of 20 students in control and experimental groups. At first, an anxiety pre-test was given and the amount of students' educational achievement was studied. Then, there were 12 sessions of critical thinking treatment and a post-test. Finally, the results of pre-test and post-test were compared and analyzed via SPSS software. The results indicated that the test anxiety in pre-test was approximately the same in both groups, but after critical thinking treatment sessions in experimental group, the anxiety was decreased to a great deal in post-test. The results of educational achievement test are indicator of dissimilar changes in control and experimental groups. The amount of achievement in experimental group indicates some sort of increase in post-test rather than pre-test. Regarding the results, it is possible to say that critical thinking training can be found useful in junior high school level.

Key words: Critical thought, test anxiety, educational achievement

Introduction

Nowadays, most theorists believe that the critical thinking will provide the basis for understanding skills and evaluating the new knowledge. Critical thinking is an epistemic process through which the acquirer makes judgments and decisions via considering the causes, analyzing the available data, and inferring results. In other words, it is a self-regulated and purposeful process that leads to problem-solving and appropriate illation (Gharib, 2009).

In the current world, the basic subject is to grow up human beings that think well and to acquire the speculation skills increasingly for facing the wonderful changes of the 21st century to decide well and solve societal complicated problems. The teacher is a key factor in students' thought cultivation. Teachers should reconsider their roles and concentrate on skills and methods that students need for critical thinking in such a system. They also should emphasize on the importance of cultivating intellectual talents rather than accumulating the data and records. Critical thinking is one of the most vital skills in today's society, and lack of this ability can avoid people from their effective social participation. Critical thought is considered as a basic epistemic process that increases the students' ability in anxiety decrease, problem-solving, decision making in social

conditions, educational achievement, and the like. Cultivating the critical thinking skills as the final goal of educational system, can't be reached except through curricula (Athari, 2010).

Statement of the problem

In critical thinking, we focus on a subject through logical and systematic consideration of problems, evidences, and solutions (Volfulk, 2004 ,as cited in Seif, 2008). With the widespread invasion of information in today's growing world, we must seek for an effective method for sifting the information and the critical thinking will provide this for people to grasp the truth in the chaos of events and information and to accomplish their goal that is reaching to the most complete comprehension. The joint of this sifting and systematic information finally leads to what is called success and becomes the basis of differentiation of thoughtful people from the public (Vigenes, 2000, Alder and Pole ,1994, as cited in Seif, 2004). Critical thinking is meant as the ability of thoughtful people in challenging their own thoughts. They believe that this is possible when the learners select precise standards and norms for evaluation and analysis of their thoughts and use them regularly for their thought improvement (Seif, 2004). In the traditional educational system, training involves the transfer of knowledge and information from teacher or instructor's to student or instructor's mind. This system is called teacher – oriented in which the teacher played the basic and central role. The setting of the chairs behind each other in the class reveals that all students must pay attention to the teacher and his or her instructions. In this method, no sense of intellection, creativity, vulnerability or criticism is created in the learners and they are supposed to memorize the contents and pamphlets so that during assessment, that is final or cumulative and convergent, they are given a test based on numerical scale (0-20) and they fail or pass due to what they know by heart. In this system, the anxiety is so wide-spread since the destiny of the student depends on a specific day of final or matriculation exam and the course period is regarded unimportant. The student can go to the next level of study or enter university based on what he knows by heart and not according to skill, intellectual ability, or speculation. By the existence of such a system, we have heard a lot that children avoid going to school or that anxiety has caused academic failure or societal isolation (Biabangard, 2007).

The main context of the improvement of each community is based on the trained or well-educated individuals. Thus, it is necessary to acquire skills and to be able to transform their knowledge to behavior in practice with successive rehearsals. Regarding the fact that anxiety is considered as a humane behavior, by adding the life skills including critical thinking, we might be able to decrease it. Thus, in this study, we are supposed to consider the effect of critical thinking training on educational achievement and the amount of test anxiety on junior high female students in Saveh, Iran.

The Review of Literature

Nasrabadi et al. (2012), in a research entitled the role of critical thinking attitude and learning epistemic styles among the students' achievement in Medical Sciences University. According to the findings, critical thinking attitude and speculative observation revealed a 5 percent of educational achievement changes. There is also a positive correlation between the active experimentation and educational achievement. There is also a difference between the achievement score and critical thinking attitude in learning styles. The convergent style was accompanied by the highest educational achievement score and the highest critical thinking attitude. There is a negative correlation between critical thinking attitude and speculative observation, while this correlation with abstract conceptualization is positive.

Mpson (2000) in a research named “considering the critical thinking skills among medical students in Shiraz concluded that the students’ abilities and capabilities could not increase in parallel with going to upper educational grades. The policy makers , program developers and educational managers, should help the learners to reinforce the medical students’ critical thinking with reforming the curriculum and providing appropriate educational environment and facilities .

Tsui and Gao (2007) considered the relation between the seminar method and students’ critical thinking improvement. The results revealed that the seminar method is effective in critical thinking achievement. The correlation between seminar contents, active learning, and critical thinking achievement is a blatant factor in curriculum, and the power to keep students’ information.

Hypotheses

Regarding the above-mentioned purposes, the following hypotheses were raised:

There is a significant difference between educational achievement of experimental group before and after the critical thinking training.

There is a significant difference between test anxiety of experimental group before and after critical thinking training.

There is a significant difference between educational achievement of control and experimental group after critical thinking training.

There is a significant difference between the test anxiety of control and experimental group after critical thinking training.

Methodology

Research Design

The design of the current study is quasi-experimental with pre-test, post-test. In this design, the researcher would consider and experiment the effect of one method on changing some variables.

The statistical sample

The sample of current study includes all 3rd grade junior high school students of one school in Saveh in educational year 2012-13. Among them, 40 students who had the highest test anxiety score were selected and divided into 2 groups of 20 students.

The sample group

The sample includes 40 students of 3rd grade high students in Saveh including 20 students in experimental group and 20 students in control group. Sampling was totally random, in such a way that from among all Saveh schools, we considered all 3rd grade junior high students of one school via test anxiety test and from among them, we chose 40 students who scored the highest in anxiety as our sample. Then, they were divided into 2 groups of 20 students for control and experimental groups.

Instrumentation

TAI test anxiety questionnaire: Abolghasemi et al. made the anxiety list and considered its reliability and validity. This list has 25 parts in which the participants would reply the test based on a four-scale including never, rarely, sometimes and often.

The critical thinking attitude questionnaire: For assessing the critical thinking attitude, we used the California questionnaire. It includes 75 questions based on Likert scale with the items of totally agree, somehow agree, agree, disagree, disagree to a great deal and totally disagree and it was be scored from 1-6 points based on the questionnaire instructions.

Educational achievement: In order to consider the students' educational achievement, the sample's scores and average point were taken into account.

Procedure

The current study is a quasi-experimental study including pre-test and posttest. For choosing the sample group, first we used cluster random sampling to choose several schools of Saveh, then several 3rd grade classes, and at last 40 students. At first, all students were given TAI test anxiety test and CCTDI critical thinking test. Then, they were divided randomly to 2 groups of control (20 students) and experiment (20 students) and critical thinking training steps were performed on the experimental group through 12 sessions. The students of both groups were homogenized based on their anxiety test score, the average point, scores and the like. These students' educational achievement was also considered via controlling their scores and course average point. After educational course training, again a test anxiety was given to all students of both groups and their scores and average points were reconsidered. The collected data were analyzed via SPSS software and the result of both pre-test and post-test were compared.

Data Analysis

H1: *There is a significant between the educational achievements of experimental group before and after critical thinking education.*

Table 1. Paired sample t-test for comparison of the experimental group's educational achievement in pre-test and post-test

Test	N	Mean	SD	Degree of freedom	t	Sig.
Pre-test	20	14.09	1.09	19	6.9	0.01
Post-test	20	14.88	1.2			

Based on the above table, the observed $t(6.9)$ is significant at 0.01 level of significance. Therefore, we can reject the null hypothesis at significant level of 0.01 and conclude with 99 % certainty that there is a significant difference between the educational achievement of experimental group before and after critical thinking education, in such a way that the comparison of means revealed the improvement of educational achievement after critical thinking education. These results are in concordance with Nasrabadi et al. (1391), Tsivi and Gaov (2007)'s studies.

H2: *There is a significant difference between the test anxiety of experimental group before and after critical thinking education.*

Table 2. Paired sample t-test for comparison of the experimental group's test anxiety in pre-test and post-test.

Test	N	Mean	SD	Degree of freedom	t	Sig.
Pre-test	20	38.6	7.2	19	6.05	0.01
Post-test	20	35.1	2.4			

As observed in the above table, the observed t (6.05) is significant at level of significance of 0.01. Thus, we can reject the null hypothesis at the significance level of 0.01 and conclude with 99 percent of certainty that there is a significant difference between the test anxiety of experimental group before and after critical thinking training and by looking at the means, the students' test anxiety has decreased after critical thinking training.

H3: *There is a significant difference between the test anxiety of control and experimental group after critical thinking training.*

Table 3. ANOVA test for text anxiety for control and experimental group after critical thinking training.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1412.9	1	1412.9	388.3	0.01
Within Groups	54.6	1	54.6	15.02	0.01
Error	134.6	37	3/6		
Total	54689	40			

According to table 3, there is a significant effect between the students in control and experimental groups ($F(37,1)=15.02$, $P=0.01$). Therefore, we can reject the null hypothesis at significance level of 0/01 and conclude that critical thinking skill training leads to a decrease in the amount of test anxiety among 3rd grade junior high students in Saveh. The amount of intercept also reveals that about 28.9 percent of the students' test anxiety difference is relevant to critical thinking education. The following figure also shows the result of control and experimental group after critical thinking training course:



Figure 1. Linear chart of test anxiety.

As observed, although the pre-test scores of both control and experimental groups are virtually same, but the 'test anxiety' of experimental group has decreased to a great deal in post-test.

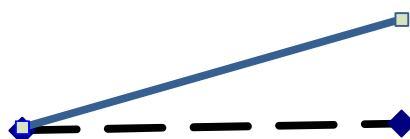
H4: *There is a significant difference between the educational achievement of control and experimental groups after critical thinking training.*

Table 4. ANOVA test for educational achievement for control and experimental group after critical thinking training.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	39.8	1	39.8	272.2	0.01
Within Groups	6.8	1	6.8	46.4	0.01
Error	5.4	37	0.146		
Total	8453.7	40			

The above table reveals that the difference is significant at the significance level 0.01 is meaningful ($F(37,1)=46.4$, $P=0.01$). In other words, the educational achievement change is not the same in control and experimental groups. As it is shown in table 4 and Figure 2, the amount of educational achievement of experimental group has increased in post-test, in comparison to the pre-test. Thus, we can reject the null hypothesis at significance level of 0.01 and can mention with 99 percent certainty that the critical thinking training has increased the educational achievement of 3rd grade junior high students in Saveh. The intercept also demonstrates that about 55.7 percent of students' educational achievement difference is due to critical thinking education.

As it is observed from Figure 2, there has been a significant increase in experimental group students' educational achievement after critical thinking education.

**Figure 2. Linear chart of educational achievement.**

In today's world, having lots of data is not helpful; what is important is the use of that bulk of information and its use in every life aspect. For this, it is a necessity for learners to reach to high levels of thought and self-knowledge and to be mastered in problem-solving and epistemic processes. This necessity is doubled in academic studies.

Nowadays, the most important issue in education system is training people that can think well and make decisions well to solve complex problems. The national education goals convention, finds critical thinking ability, impressive relations and problem-solving a necessity in making a breakthrough in educational achievement (Kuing and Muing, 2008).

Conclusion

Although the world has seen a great evolution comparing the past, this does not necessarily equal with education improvement. The formal education deals with presenting knowledge via thematic contents that instead of teaching how to speculate, they focus more on cultivating skills.

However, advanced level thought education facilitates learners' dealing with various challenges in personal, vocational life and citizenship and the outcome is cultivating dependent acquirers that could be able to face evolutions logically.

The results obtained from the current study reveals that critical thinking in test anxiety and educational achievement has also a positive effect. The results of the first hypothesis indicated that the critical thinking training in experimental group has caused students' achievement to a great deal and better results. But there is no change in control group.

Regarding the second hypothesis, the obtained results indicated that, although the pre-test anxiety score of both groups is approximately the same, there has been a decrease in post-test scores of experimental group students, while the anxiety decrease of control group students in post-test is intangible compared with pre-test.

As far as the results of third hypothesis is concerned, it revealed that the educational achievement changes are not the same between control and experimental groups' students.

Finally, there has been a significant increase in experimental group's educational achievement after critical thinking education. In other words, 'critical thinking skill education' has led to a decrease in anxiety among 3rd grade junior high students in Saveh.

Limitations of the study

The obtained results of this study should be taken into account by considering the following limitations:

The effective mental factors like anxiety, fatigue, lack of attention or concentration while answering the questionnaire due to giving such questionnaires by other students or public organizations and the like may decrease the reliability and validity of precise data collection and the required time.

The existence of inclinations, bias, past experiences, and the like can have a negative influence on the results.

Suggestions for further research

Finally, the following issues can be taken into consideration for further studies:

Conducting research in both sex (male and female) and their comparison.

Conducting research on the effect of other thinking skills training techniques on decreasing test anxiety and increasing educational achievement.

Considering the knowledge and profession of educational executives of critical thinking curricula that is part of learners' life skill education program.

Familiarizing the parents and instructors with the concept of practical critical thinking and differentiating between critical thinking and other thoughts such as creative thinking.

References

Athari, Z.S. (2007). *The study of the relation between entrance exam for university and critical thinking skills scores among the students in Isfahan University and Isfahan Medical Sciences*. Unpublished Master's thesis, Isfahan University.

- BakhtiarNasrabadi, H.A., Norouzi, R.A., &Habibi, N. (2012).*New ideas in training and education philosophy*.SamaeGhalam Publication, Tehran.
- Biabangard, A. (2007). What can we do for text anxiety?,*PeikeSanjesh*, 6(4).
- Gharib, M., Rabiian, M., Salsali, M., Hajizadeh, E., SabouriKashani, A., &Khalkhali, H.R. (2009).Critical thinking skills and a tendency toward critical thinking among the students in the Management of Medical-Sanitary Services, *Training in Medical Sciences Journal*.
- Hownstein. M. A. (1996). Factors associated with critical thinking. *The Journal continuing education in nursing*, 1(6).
- Khalilzadeh, N.A., &Soleimannezhad, A. (2004).*Critical thinking*.Mehre Amir Almomenin Publication, Qom.
- LashkariPor, K., Bakhshayeshi, N., &Soleimani, M. (2006).*The study of relationship between text anxiety and educational performance among the students in secondary schools in Zahedan*.Zahedan University of Medical Sciences, Psychiatry and Clinical Psychology Department.
- Nelson, T.O. (2001). *Meaning of Critical thinking*.*Critical thinking and Education*.Cambridge university press.
- Seif, A.A. (2004). *Training education (The psychology of education and training)*.Agah Publication, Tehran.
- Seif, A.A. (2008). *Modern training education (The psychology of education and training)*.Doran Publication, Tehran.
- Simpson, E., Courtney, M.D. (2002). Critical thinking in nursing education: A literature review.*International Journal of Nursing Practice*, 8, 89-98
- Tsui, L. Gao, E. (2007). The efficacy of Seminar Courses.*Journal of College Student Retention: Research, Theory & Practice*, 8(2).